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**THE**  
**RELIABLE**  
**RETURN LINE**  
**VACUUM**  
**HEATING**  
**SYSTEM**



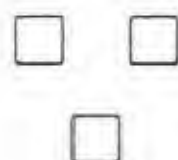
Manufactured by  
**The Bishop-Babcock-Becker Co**







# THE RELIABLE RETURN LINE VACUUM HEATING SYSTEM



*This Catalog Supersedes  
all Previous Issues*

Manufactured by

**THE BISHOP-BABCOCK-BECKER CO.**

Cleveland - 49th St. & Hamilton Ave.  
New York City - 431-41 Lafayette St.  
Milwaukee - 229 Cedar St.  
St. Louis - 210-212 S. Broadway

Chicago - 219-225 W. Washington St.  
Cincinnati - 1025 Central Ave.  
St. Paul - 338-40 Minnesota St.  
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## Foreword

**Y**OU will find in this catalog a thorough description of the "Reliable" Return Line Vacuum Heating System. Each part of the equipment is illustrated and described separately; and the installation and operation is also clearly explained.

We want to emphasize here the fact that all the "Reliable" Equipment is manufactured, properly tested and adjusted, and guaranteed by us. You will appreciate the advantage of installing equipment made and guaranteed by one Company, rather than equipment the parts of which are made by several Companies, none of which can be responsible for its satisfactory operation.

Your special attention is directed to the following guarantee, which puts the responsibility directly up to us, the manufacturers.

*WE guarantee the "RELIABLE" HEATING EQUIPMENT furnished by us to be correct in mechanical principles and construction.*

*We guarantee that all parts have been properly tested and adjusted, and are free from original defects in material and of first-class workmanship.*

*We agree, free of charge, to replace or repair any parts proven defective — ordinary wear and tear, abuse and neglect excepted — upon delivery to our factory for inspection.*

THE BISHOP-BABCOCK-BECKER CO.

THE BISHOP-BABCOCK-BECKER CO.



# VACUUM HEATING SYSTEM

## WHAT IT IS, AND DOES

The "Reliable" Return Line Vacuum Heating System is used in connection with a steam heating plant to produce quick, thorough and even heat circulation, at any desired temperature, and in any kind of weather, with a great fuel saving.

The "Return Line" Vacuum Heating Equipment is installed at low cost; the operating expense is very low.

The "Reliable" Return Line Equipment is automatic and noiseless in operation; no hissing radiators or hammering in the pipes; no possibility of freezing; no steam escape; no leaky vent valves; and all our equipment is properly adjusted at our factory.

## ADAPTABILITY OF SYSTEM

The "Reliable" Return Line Vacuum Heating System is equally efficient for new or old two-pipe steam heating plants, in any style or size building.

*See page 5 for using the "Return Line" System in connection with steam heating plants already installed.*

## STEAM SUPPLY

The "Reliable" Return Line System is operated by steam from a low pressure boiler; steam from a central station; exhaust steam; or steam from a high pressure boiler, if reduced and regulated not to exceed 15 pounds pressure.

When exhaust steam is used, the "Return Line" Vacuum Pump will pull steam into the heating system and reduce back pressure on the steam engine or pumps, which results in additional economy. It is usually necessary to by-pass live steam into an exhaust steam system to insure a constant steam supply.



## THE "RELIABLE" RETURN LINE

With central station supply the steam pressure is often so low at the ends of mains and laterals that it will not circulate in the ordinary heating system. This trouble is overcome by the "Reliable" Equipment, as the vacuum pump eliminates air resistance and pulls the steam into all radiators.

### LOW COST OF INSTALLATION

"Reliable" Return Line Vacuum Heating Equipment is manufactured *complete* at our factory. We thoroughly test our equipment, and the adjustments are *properly* made. Therefore, when "Reliable" Vacuum Heating Equipment arrives at a building, it is ready to be installed—*no bother or delays are occasioned in making adjustments when installing.*

There is nothing complicated about the "Return Line" Equipment, and the installation is accomplished *quickly at low cost.*

When a "Reliable" Return Line System is used in connection with a two-pipe steam heating plant already installed, practically all the old equipment is utilized. See page 5 for further particulars.

### LOW UPKEEP OR OPERATING EXPENSE

As "Reliable" Electric Vacuum Pumps have large capacity, air and all condensation is rapidly drawn out of a heating system, and the proper degree of vacuum quickly created. A partial vacuum from steam condensing in radiators and coils pulls steam into them, without pump operation. The vacuum held in the expansion tank and return piping assists the pump to keep system free from air and condensation, *insuring less frequent pump operation.* In a tight system a "Reliable"



## VACUUM HEATING SYSTEM

Vacuum Pump operates not more than  $\frac{1}{3}$  of the time, which explains why the operating expense is very low.

The Vacuum Controller which operates the Automatic Electric Switch is *positive acting*—the vacuum pump can start and operate only when necessary.

### A STEAM HEATING PLANT ALREADY INSTALLED IS MADE 100% EFFICIENT BY THE “RELIABLE” SYSTEM

The “Reliable” Return Line Vacuum Heating Equipment can readily be applied to two-pipe steam heating plants already installed, and nearly all of the old equipment is utilized.

#### *The following equipment and changes are required:*

The “Reliable” Equipment consists of Electric Vacuum Pump (of sufficient capacity) with equipment as listed on page 6, Automatic Air Separating Tank and “Vacu-Traps” (one for each radiator or coil, and on drips from the steam main). All the “Reliable” Equipment is thoroughly described in this catalog. See detailed layout on pages 12 and 13, which shows proper method of installing.

If the supply and return piping is of ample size and properly installed, it does not have to be disturbed.

The radiators and coils are utilized, as well as the supply valves.

The boiler is always used, unless the capacity is insufficient. If the boiler is not equipped with an equalizer pipe, one should be installed. It is usually connected to the header and to return at boiler.

*Note:—It is important that all the connections are made perfectly tight. The System should be thoroughly cleaned before being put in operation*



## THE "RELIABLE" RETURN LINE

### "RELIABLE" ELECTRIC RETURN LINE OUTFITS

Nos. 122, 123, 124 AND 125

These outfits comprise a complete working unit and consist of the following:

Vacuum Pump including Base, Check Valves, Belt, Special Automatic Belt Tightener and Grease Cups.

Electric Motor, either direct or alternating current. (Specify voltage if direct current motor is required, and voltage and cycles if alternating current. We furnish single phase alternating current motors *only*, as they operate on 2 or 3-phase circuits, whereas 2 or 3-phase motors will not run on single-phase current).

Automatic Electric Switch and Vacuum Controller No. 1859.

Strainer, (No. 2279 with No. 122 and 123 Outfits, and No. 2289 with Outfits No. 124 and 125).

Expansion Tank.

Vacuum Gauge.

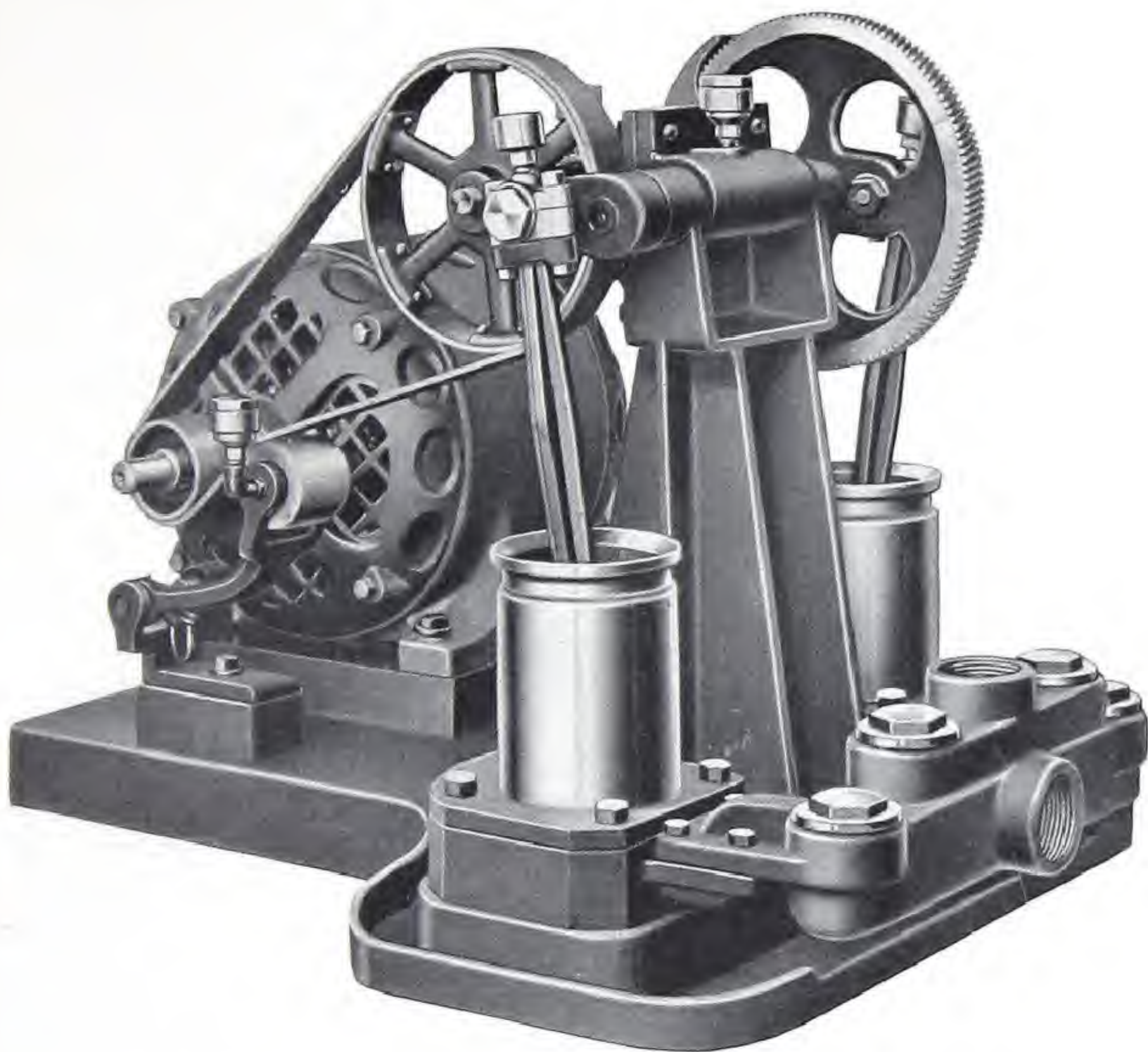
Flanged Union Connections.

*Note:—Please bear in mind that our heating engineers are at your service, and are always willing to give you information; also to help you select "Reliable" Equipment that will give you the best and most economical service.*



# VACUUM HEATING SYSTEM

## “RELIABLE” RETURN LINE ELECTRIC VACUUM PUMPS Nos. 122 AND 123



*See page 6 for list of equipment included with this pump*

### NOTE THE SIMPLICITY

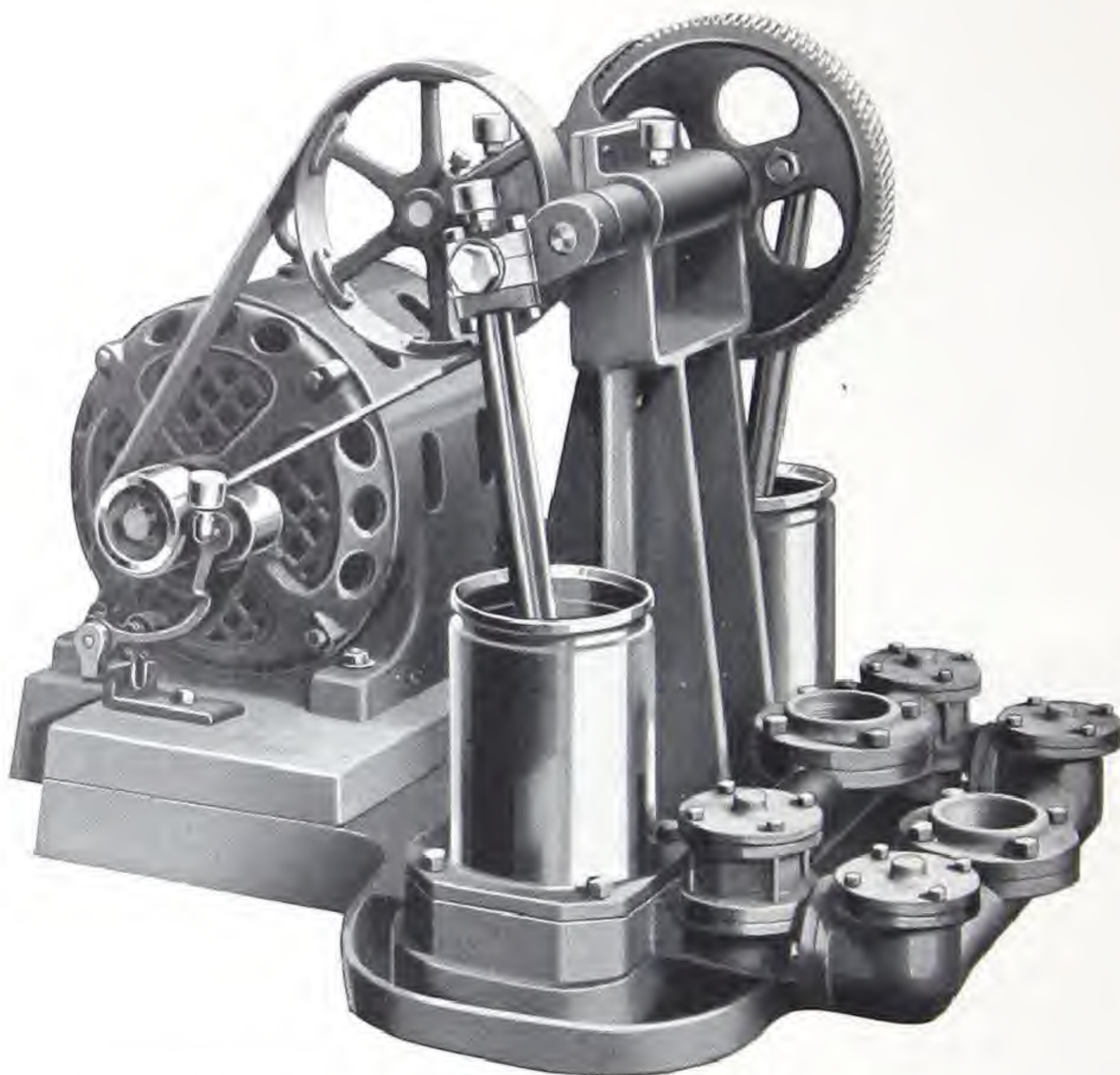
The “Reliable” Electric Vacuum Pumps, being positive acting, require much less power than any other vacuum pump, so the cost for current is only  $\frac{1}{3}$  to  $\frac{1}{5}$  that of other makes. “Reliable” Pumps are remarkably simple in construction, with no small or complicated parts to get out of order, causing trouble and costly delays.

*See page 9 for complete description*



## THE "RELIABLE" RETURN LINE

### "RELIABLE" RETURN LINE ELECTRIC VACUUM PUMPS Nos. 124 AND 125



*See page 6 for list of equipment included with this pump*

The "Reliable" Electric Vacuum Pumps are automatic; noiseless; and draw air and condensation continuously when in operation. With their double speed reduction, they work so perfectly that they use but  $\frac{1}{3}$  to  $\frac{1}{5}$  the power required to operate other vacuum pumps. The cost for electric current is lower in proportion.

*See next page for detailed description*



DESCRIPTION OF "RELIABLE" ELECTRIC  
VACUUM PUMPS Nos. 122, 123, 124 AND 125

The "Reliable" Pumps are simple in design and durably constructed, and can always be depended on to operate satisfactorily, year in and year out.

Following is a detailed description:

*Cylinders.* These pumps have two vertical, single-acting cylinders, which always draw air and condensation steadily when in operation. The cylinders are heavy iron, lined with seamless brass tubing.

*Large Capacity.* The pumps have unusually large capacity. See page 23 for number square feet radiation each pump is capable of handling.

*Electric Motors* are furnished, either direct or alternating current, of standard make. They start easily under full load, and will operate on a 10 per cent variation in voltage. (Specify voltage if direct current motor is required, and voltage and cycles if alternating current. We furnish single phase alternating current motors *only* as they operate on 2 or 3-phase circuits, whereas 2 or 3-phase motors will not run on single phase current).

*Special Automatic Belt Tightener* always keeps belt tight, and prevents it slipping—there is no lost motion, or binding. Friction and wear are reduced to a minimum.

*Pistons* are grey iron, packed with three rings of best flax packing, and have compensating springs, which automatically take up wear in packing. The connecting rods are iron, with bronze bushings.

*Valves* are extra large, designed especially for handling air and condensation. The valves always operate and seat perfectly; are noiseless; and are readily accessible. They are made of a special composition, which is exceptionally durable. The bronze valve seats are removable.

*Bearings.* The main shaft bearings and pinions are solid bronze.

*Base* is heavy iron, cast in one piece. It has a gutter around the edge in form of a drip pan, which keeps oil off floor.

*Lubrication.* All bearings have large grease cups, which require only occasional filling.

*See page 23 for specifications and dimensions of these Vacuum Pumps*



AUTOMATIC ELECTRIC SWITCH AND  
VACUUM CONTROLLER No. 1859

The Automatic Electric Switch and Vacuum Controller is used with "Reliable" Electric Vacuum Pumps, to insure their automatic operation, and maintain the desired vacuum in a heating system. When the proper degree of vacuum has been created in a system, the Automatic Electric Switch, by means of the Vacuum Controller, automatically stops the pump. When the vacuum is lowered 2 inches, the pump is automatically started.

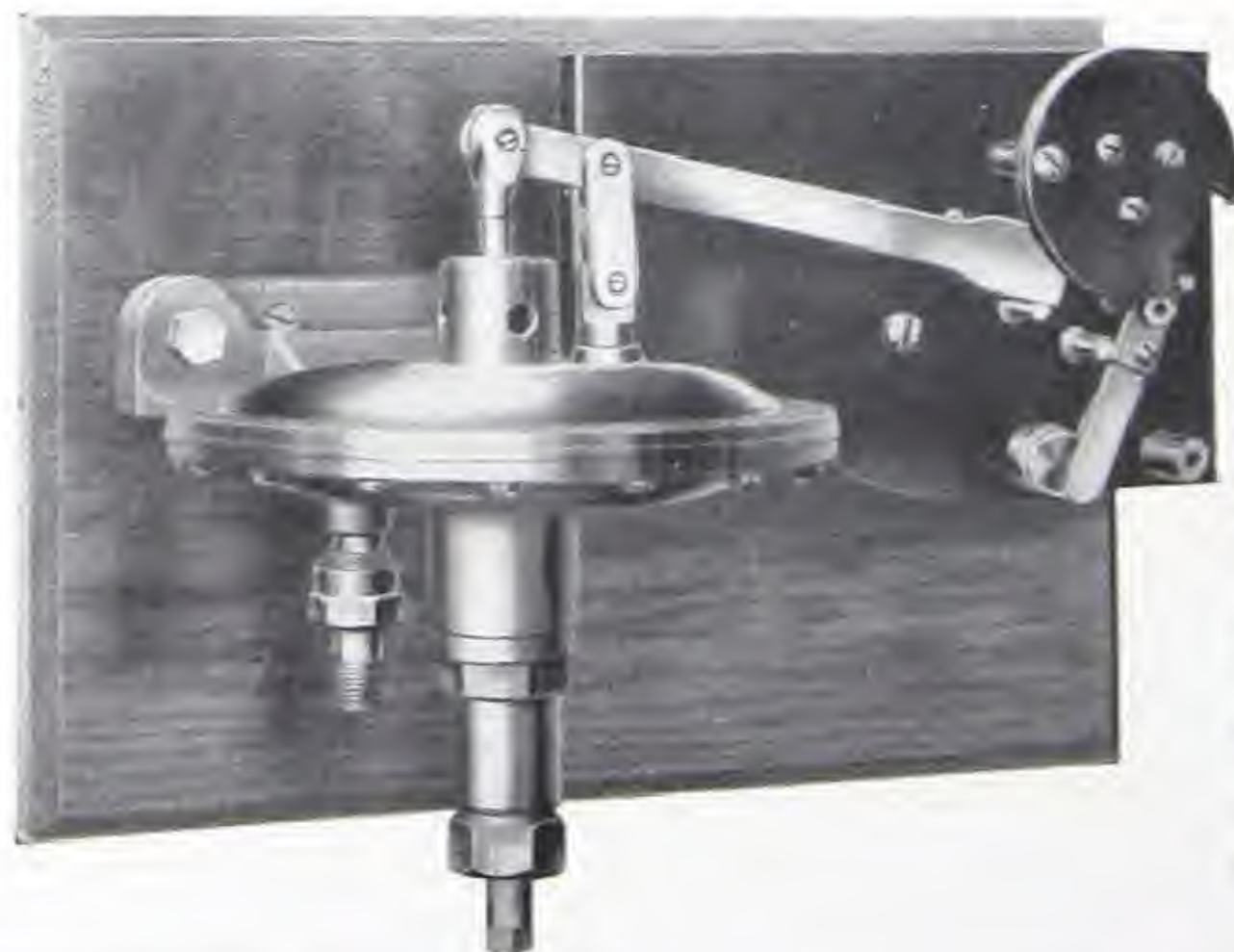
The action of the Vacuum Controller is *positive*, and the proper degree of vacuum is *always* maintained. It is easily adjusted for any range of vacuum. The Automatic Electric Switch has only one knife blade, and a *perfect* connection is assured.

The Automatic Electric Switch is very substantially made, and is mounted on a neat slate panel. The Vacuum Controller is constructed of heavy bronze, and is mounted with Automatic Electric Switch.

The Automatic Electric Switch and Vacuum Controller No. 1859 is very simple; has no parts to get out of order; and enables "Reliable" Electric

Vacuum Pumps to be operated very economically.

The Automatic Electric Switch and Vacuum Controller is included with all "Reliable" Return Line Electric Outfits.





## "RELIABLE" RETURN LINE STRAINER



Nos.  
2279  
2289

A Strainer of large capacity is furnished with "Reliable" Return Line Outfits. All air and condensation passes through this Strainer, which prevents scale, grit, and other foreign matter entering vacuum pump.

The Strainer usually requires cleaning only once each heating season. It is cleaned by simply removing cover plate, opening discharge valve at bottom, and flushing with water.

*Note :— No. 2279 Strainer is furnished with "Reliable" Return Line Outfits Nos. 122 and 123, and No. 2289 Strainer with Outfits No. 124 and 125.*

## EXPANSION TANK

An Expansion Tank of proper size is used with "Reliable" Return Line Outfits to hold a steady vacuum in the heating system. The vacuum in Expansion Tank assists the pump to draw air and condensation from the system. *This insures additional economy.*

As the Automatic Electric Switch and Vacuum Controller is connected to Expansion Tank, a steady vacuum is always on the Vacuum Controller, which assures *perfect* operation of Automatic Electric Switch — *the vacuum pump can operate only when necessary.*

An Expansion Tank is always included with "Reliable" Return Line Outfits.



## DETAILED DESCRIPTION OF OPERATING ELECTRIC VACUUM HEATING

Refer to detailed layout, showing method of returning to boiler.

Boiler connections and steam supply main are same as in previous system, and the end dripped to return line. The return piping is sized for the amount of radiation.

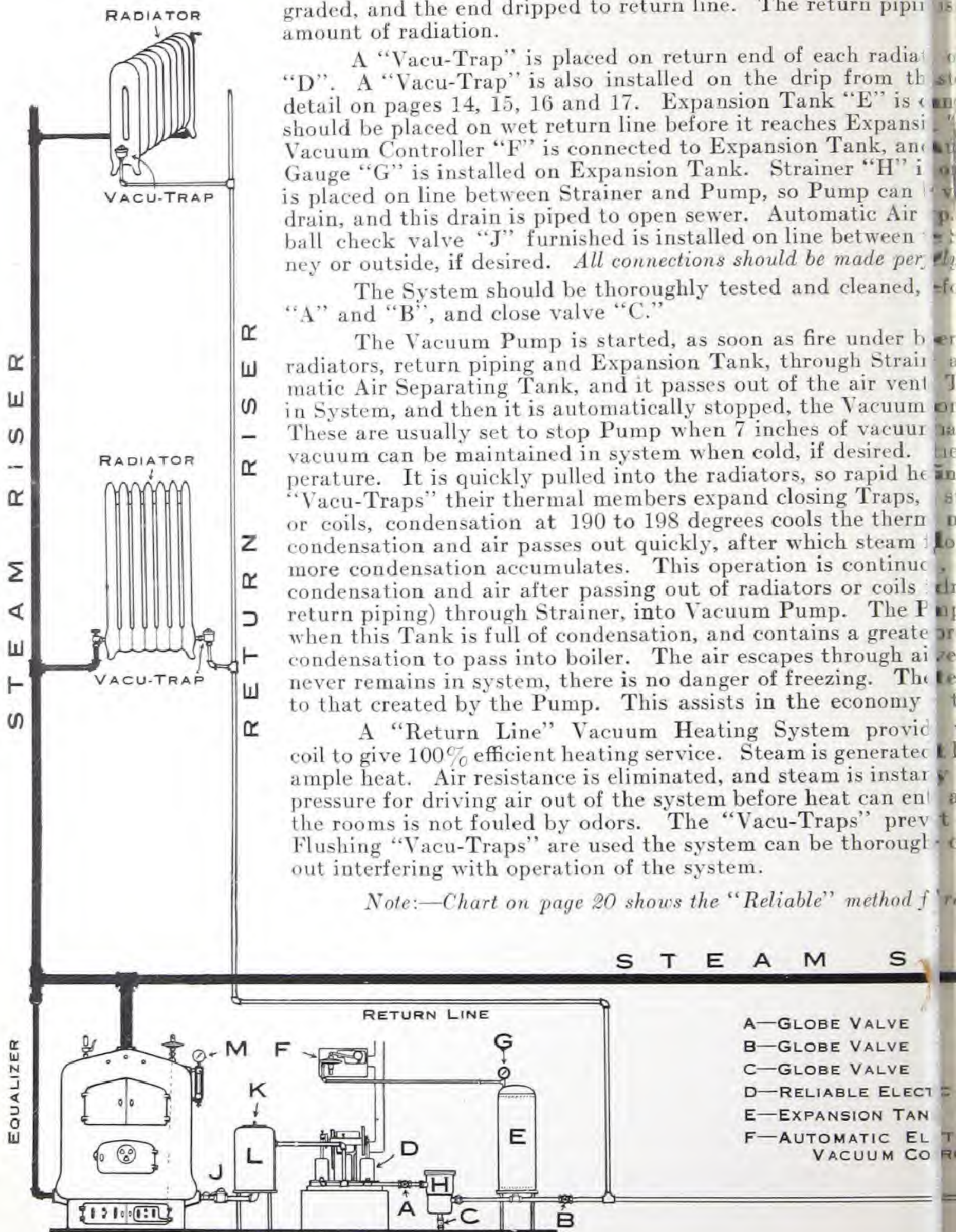
A "Vacu-Trap" is placed on return end of each radiator. A "Vacu-Trap" is also installed on the drip from the radiator. Detail on pages 14, 15, 16 and 17. Expansion Tank "E" is connected to wet return line before it reaches Expansion Tank. Vacuum Controller "F" is connected to Expansion Tank, and Gauge "G" is installed on Expansion Tank. Strainer "H" is placed on line between Strainer and Pump, so Pump can be cleaned, and this drain is piped to open sewer. Automatic Air Separating Tank "J" furnished is installed on line between boiler and pump, or outside, if desired. *All connections should be made perfectly.*

The System should be thoroughly tested and cleaned, before starting. Close valve "A" and "B", and close valve "C."

The Vacuum Pump is started, as soon as fire under boiler. Steam from radiators, return piping and Expansion Tank, through Strainer and Automatic Air Separating Tank, and it passes out of the air vent in System, and then it is automatically stopped, the Vacuum Pump is started. These are usually set to stop Pump when 7 inches of vacuum can be maintained in system when cold, if desired. The vacuum is quickly pulled into the radiators, so rapid heating. "Vacu-Traps" their thermal members expand closing Traps, or coils, condensation at 190 to 198 degrees cools the thermal members, condensation and air passes out quickly, after which steam is more condensation accumulates. This operation is continuous, condensation and air after passing out of radiators or coils (in return piping) through Strainer, into Vacuum Pump. The Pump is started when this Tank is full of condensation, and contains a greater amount of condensation to pass into boiler. The air escapes through air vent, never remains in system, there is no danger of freezing. The vacuum is to that created by the Pump. This assists in the economy of the system.

A "Return Line" Vacuum Heating System provides a vacuum heating coil to give 100% efficient heating service. Steam is generated in boiler, and ample heat. Air resistance is eliminated, and steam is instantly available for driving air out of the system before heat can enter the rooms is not fouled by odors. The "Vacu-Traps" prevent the system from Flushing "Vacu-Traps" are used the system can be thoroughly cleaned out interfering with operation of the system.

*Note:—Chart on page 20 shows the "Reliable" method of returning to boiler.*





## ON OF THE "RELIABLE" RETURN LINE SYSTEM WITH TYPICAL LAYOUT

ensation to low pressure boiler.

an ordinary two-pipe steam heating plant. Steam supply main is smaller than is required for an ordinary plant, the sizes depending on

coil, and connected with return piping, leading to Vacuum Pump supply main and riser. The "Vacu-Traps" are described in detail to wet return line, before it enters Strainer. A globe valve "B" on tank connection, so Vacuum Pump, etc., can be valved off for testing. Automatic Electric Switch "F" wired to motor and to fuse box. Vacuum connected to wet return line and to Vacuum Pump. A globe valve "A" valved off when necessary. The Strainer has a globe valve "C" on the Heating Tank "L" is connected to Vacuum Pump, and to boiler. The Air Separating Tank and boiler. The air vent "K" may be piped to chimney or to outside.

Before being put in operation. Before operating, fully open globe valves

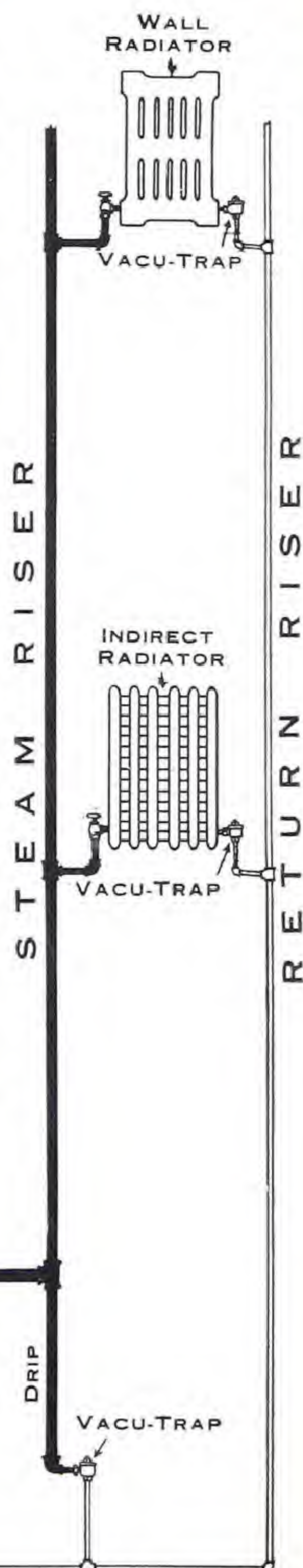
is lighted, and immediately draws air from the boiler, supply piping, and into the Vacuum Pump. The Pump discharges the air into Atmosphere. The Pump will continue to operate until the desired vacuum is created. The Automatic Electric Switch shutting off the electric current. When vacuum has been created, and start it again when vacuum drops to 5 inches. A vacuum in boiler enables steam to generate at lower than steam temperature. It is assured throughout entire system. The instant steam reaches the radiators it cannot pass into return line. When steam condenses in radiators, causing them to contract. This opens "Vacu-Traps", and all steam again expands thermal members, closing the "Vacu-Traps" until radiators or coils are *always* heated up to full temperature. The vacuum is drawn out of return line (assisted by vacuum in Expansion Tank and forces condensation and air into Automatic Air Separating Tank, and since the boiler is at a lower pressure than boiler, the ball check valve opens automatically, allowing steam to pass into Separating Tank, in manner already described. As condensation in radiators or coils also creates a vacuum in addition to the vacuum in the System by causing less frequent operation of Vacuum Pump. It insures thorough and even heat circulation by forcing every radiator or coil to full temperature, so less fire is required, and less coal is burned to supply heat to all radiators or coils. No coal is burned to produce steam that does not circulate properly. There are no leaky or hissing radiators. Air in the system is of steam—*every particle is utilized for heating*. When No. 2 oil is burned at any time, without changing any valves or piping, and with-

turning condensation to open receiving tank.

SUPPLY MAIN

VACUUM PUMP  
ELECTRIC SWITCH AND FUSE BOX  
G—VACUUM GAUGE  
H—STRAINER  
J—BALL CHECK VALVE  
K—AIR VENT  
L—AUTOMATIC AIR SEPARATING TANK  
M—COMPOUND GAUGE

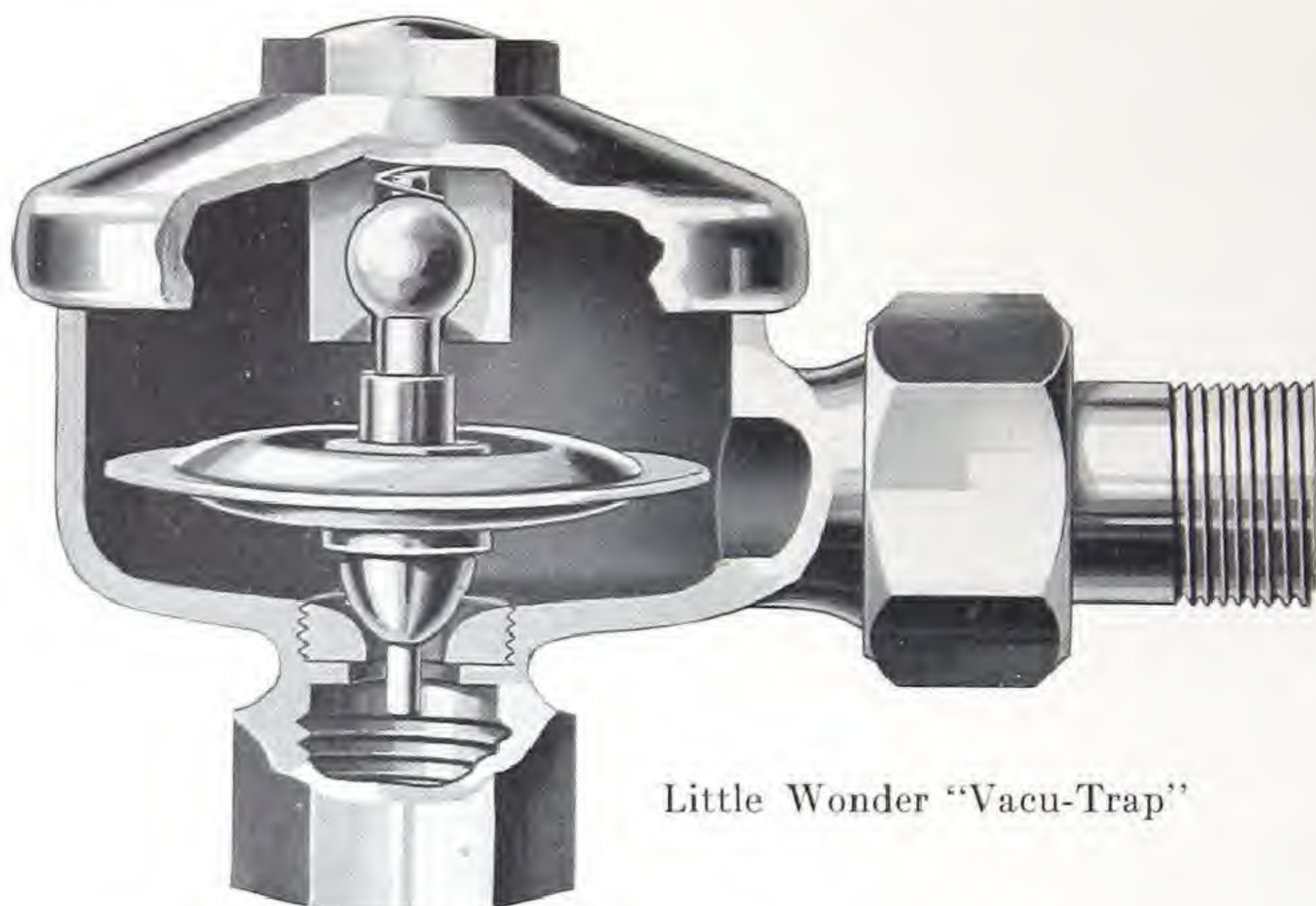
WET RETURN LINE.





## THE "RELIABLE" RETURN LINE

### THE "VACU-TRAPS" WHAT THEY ARE—HOW THEY OPERATE



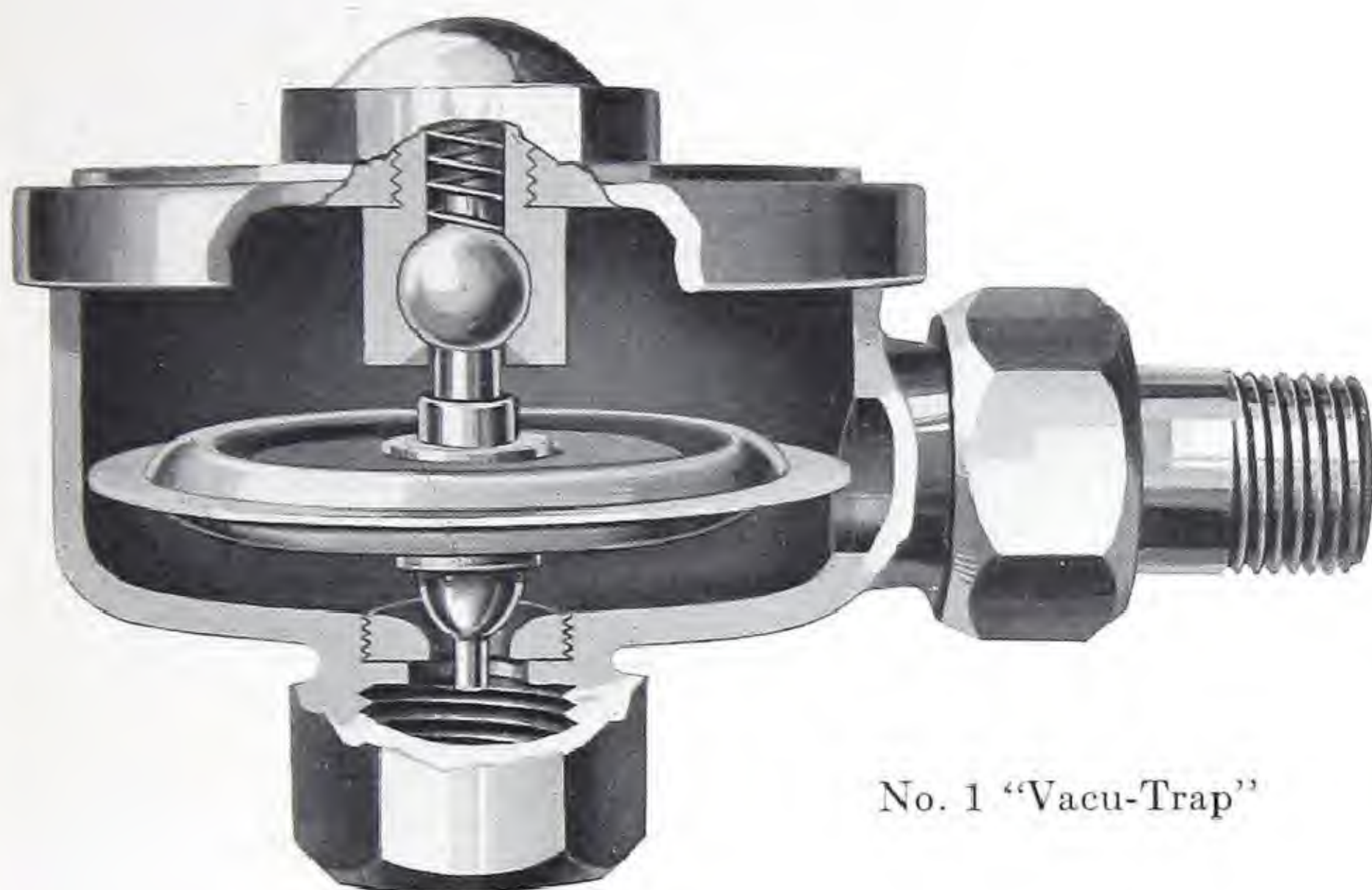
Little Wonder "Vacu-Trap"

The "Vacu-Traps" are heavy bronze thermostatic valves which automatically keep a heating system free from air, and drain the radiators or coils of condensation, without loss or escape of steam.

One "Vacu-Trap" is placed on return end of each radiator or coil. The "Vacu-Trap" allows air to be drawn out of radiators, supply piping and boiler, but when steam reaches it, its thermal member expands, closing Trap instantly. *The "Vacu-Trap" positively prevents steam entering the Return Line.* When steam condenses in radiators or coils, condensation at 190 to 198 degrees, will contract the thermal member. This opens passage to return line, allowing *all* condensation and air to pass out quickly. The steam following



## VACUUM HEATING SYSTEM



No. 1 "Vacu-Trap"

again expands thermal member, which closes Trap. All condensation is removed as fast as it accumulates, so *radiators or coils are always heated up to steam temperature.* The "Vacu-Trap" insures *thorough draining and quick air liberation* at all times.

The brass knuckle ball joint in "Vacu-Trap" supports the thermal member and, together with brass ball valve at bottom always insures *positive seating*, so *steam cannot escape.* A bronze compensating spring prevents vibration of the thermal member.

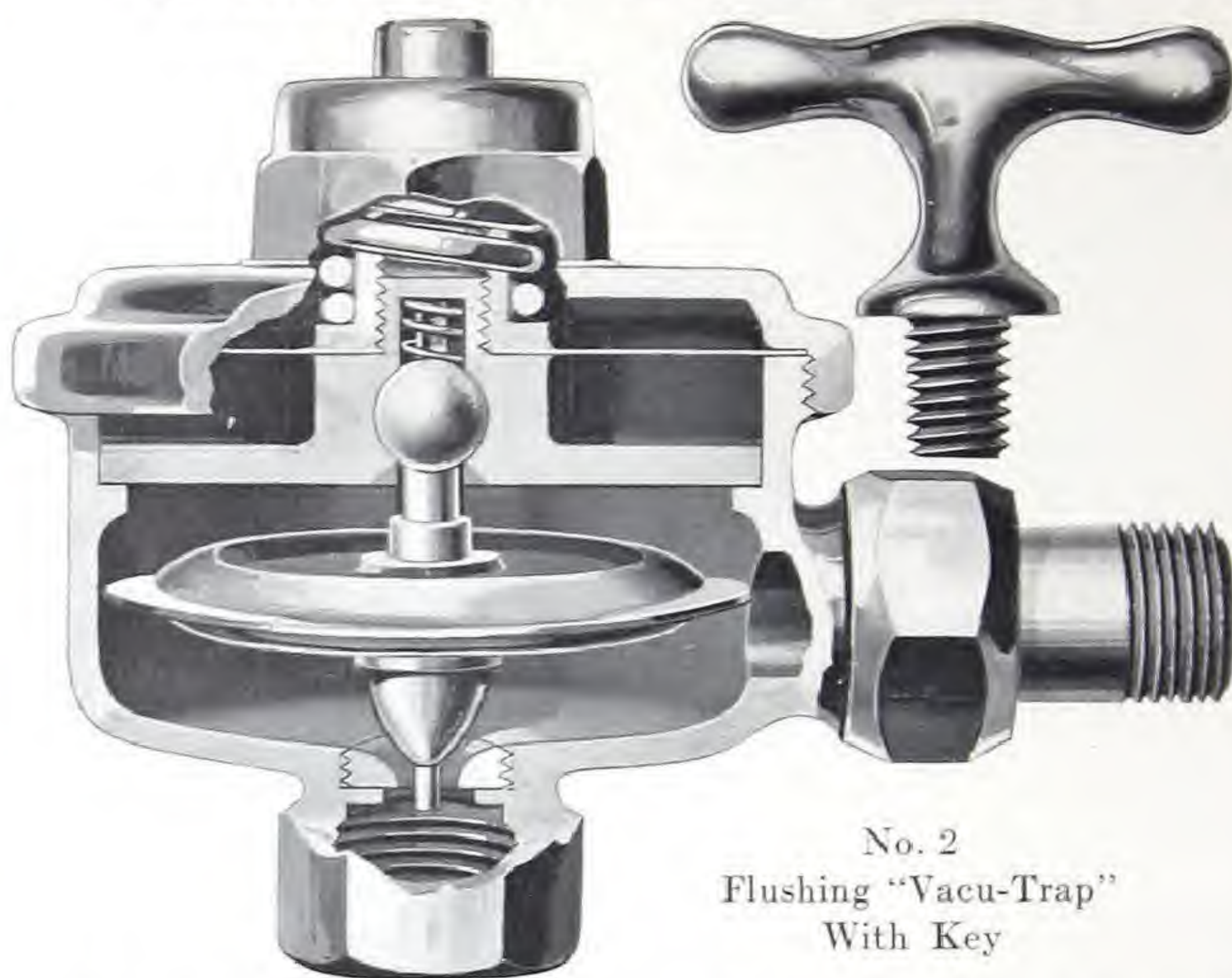
The "Vacu-Traps" force every radiator or coil to give 100% efficient heating service. They are *noiseless*, and the *most positive acting and durable* return line valves made.

*Note: — The "Vacu-Traps" are low pressure valves. We do not guarantee them when used where the pressure exceeds 15 pounds*



## THE "RELIABLE" RETURN LINE

### COMPARISON OF THE "VACU-TRAPS"



No. 2  
Flushing "Vacu-Trap"  
With Key

The Little Wonder and No. 1 "Vacu-Traps" are identical in style of construction and operation, except that the Little Wonder "Vacu-Trap" is smaller.

The No. 2 "Vacu-Trap" is a flushing trap, and no change of valves or piping is necessary for cleaning the system. The knuckle ball joint at top of thermal member fits into a socket in a bronze crossbar. This crossbar rests on a shoulder in the body, and is held in place by a heavy phosphor bronze spring. A key is furnished with each No. 2 Flushing "Vacu-Trap", which, when inserted at top and turned by hand, raises crossbar and thermal member against the spring pressure enough to permit steam to blow freely through valve across the seat, cleaning radiation and "Vacu-Traps" thoroughly of all foreign matter, through a by-pass to sewer. *Cleaning is accomplished without interfering with operation of the heating system.* After cleaning key



## VACUUM HEATING SYSTEM

is removed, the spring drops the crossbar back onto the shoulder, returning thermal member to its proper working position. A copper diaphragm fastened to the crossbar and made tight by cover of Trap, makes it a packless Valve of the best type.

Where exhaust steam is used for heating, there is always a certain amount of gummy cylinder oil in the steam, which tends to clog all valves in system. For such systems the No. 2 "Vacu-Trap" is especially valuable.

The No. 2 Flushing "Vacu-Trap" provides *thorough, instantaneous and most economical* cleaning. It is the only valve of its kind.

*See page 23 for dimensions and weights of the "Vacu-Traps"*

### CONSTRUCTION OF THE "VACU-TRAPS"

The body and cover of the "Vacu-Traps" are heavy bronze castings.

The thermal members are heavy gauge phosphor-bronze, constructed in strongest possible manner. The thermal members are filled with a volatile liquid which expands or contracts them, as temperature raises or lowers.

The removable seat at bottom of "Vacu-Traps" is solid brass, and rounded, so that dirt cannot accumulate on it.

The superior design and extra heavy construction of "Vacu-Traps" insures durability under *expansion and contraction*, without danger of breakage.

The "Vacu-Traps" are made in  $\frac{1}{2}$ " ,  $\frac{3}{4}$ " and 1" sizes. They are furnished in brass or nickel plated finish.

*See page 22 for roughing in dimensions of the "Vacu-Traps"*

### PERMANENTLY ADJUSTED

Each "Vacu-Trap" is given a 5 hour working test, and is *properly and permanently* adjusted at our factory. *No adjustments are necessary when installing, or afterward.*



## THE "RELIABLE" RETURN LINE

### "RELIABLE" VACUUM GAUGE

The Vacuum Gauge shows degree of vacuum in the heating system. It is necessary to know this, to operate a system most economically.

A Vacuum Gauge is always included with "Reliable" Return Line Outfits.



Diameter of dial,  $3\frac{1}{2}$  inches;  $\frac{1}{4}$ -inch thread connection; iron case, brass rim.

### "RELIABLE" COMPOUND GAUGE



The Compound Gauge may be used with a low pressure steam heating plant. It is placed on boiler to show whether steam pressure, or vacuum is in boiler.

A Compound Gauge is *not* included with "Reliable" Return Line Outfits, but is furnished at extra charge.

Diameter of dial,  $3\frac{1}{2}$  inches;  $\frac{1}{4}$ -inch thread connection; iron case, brass rim.

### RADIATORS AND COILS

Standard steam radiators, either direct or indirect, may be used with "Reliable" Return Line Vacuum Heating Equipment. Wall, ceiling, blast and dryer coils may also be used. The same rating applies as in ordinary steam heating.



# VACUUM HEATING SYSTEM

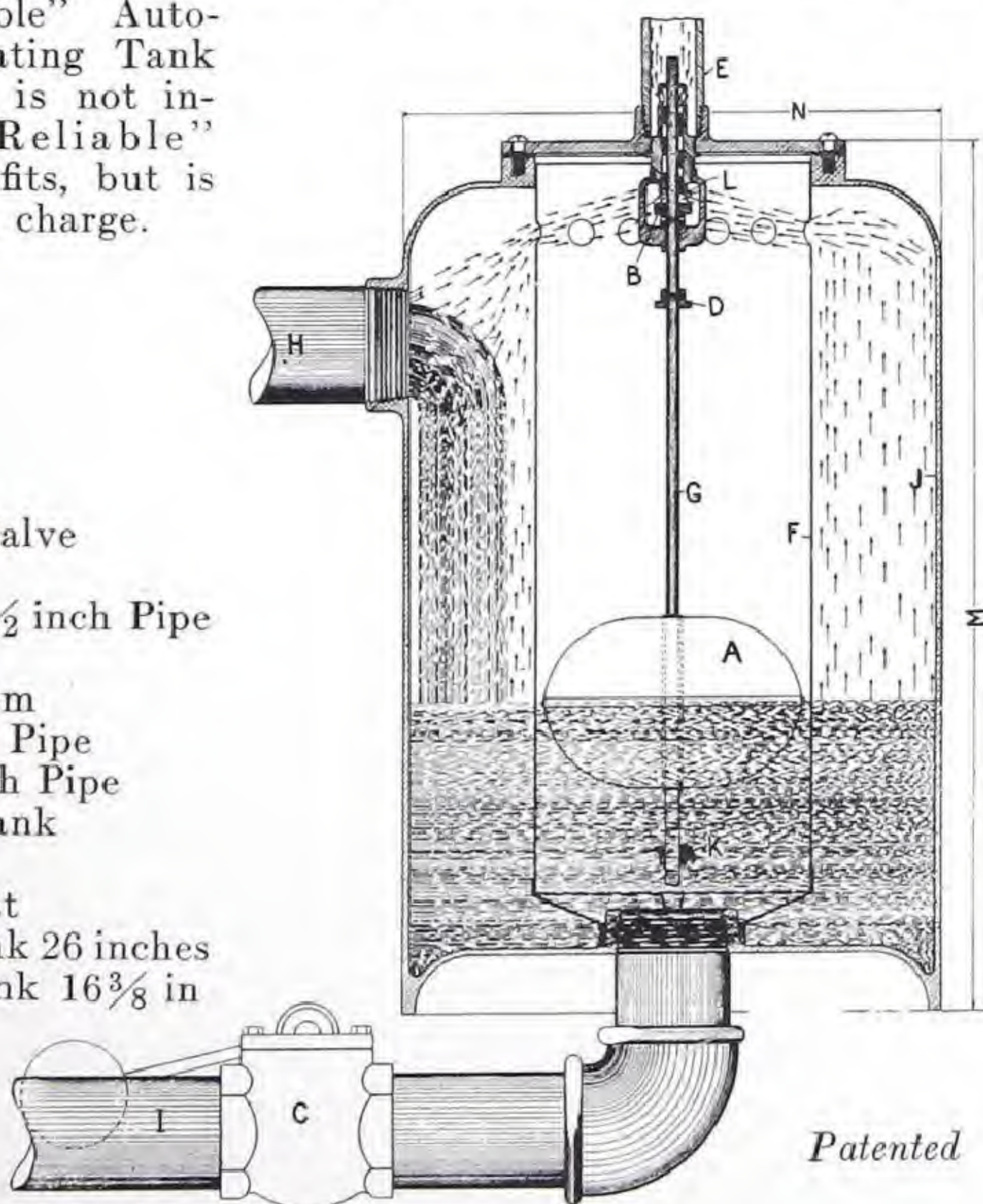
## "RELIABLE" AUTOMATIC AIR SEPARATING TANK AND EQUIPMENT

The "Reliable" Automatic Air Separating Tank and equipment is part of "Reliable" Return Line Vacuum Heating Equipment when returns are made to low pressure boiler, closed receiving tank, or closed feed water heater. The apparatus consists of a heavy galvanized iron tank of proper size fitted with an air valve, float, and ball check valve.

The air and condensation from the system are forced into this tank together by the pump. The air valve "B" remains open allowing the air to escape, while the condensation remains in tank. When tank is nearly full, the float "A" automatically closes air valve and the pump then creates a pressure in tank. When this pressure is greater than pressure in boiler, the ball check valve "C" automatically opens, and condensation passes into boiler. The air valve is kept closed by pressure in tank but is automatically opened by float when tank is nearly empty. This again allows air to escape, and boiler pressure closes ball check valve automatically, preventing boiler water from backing up into tank. The operation is then repeated.

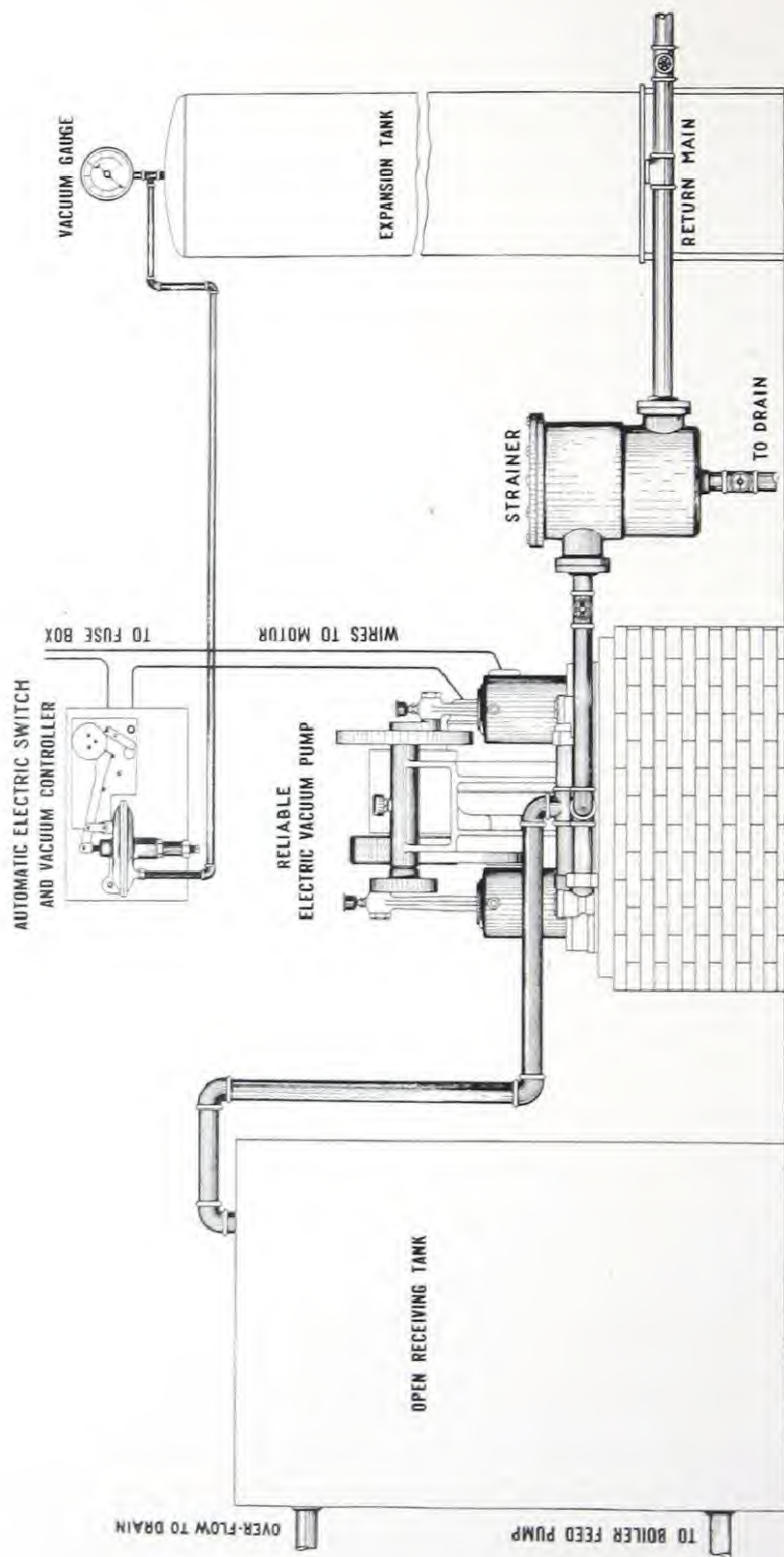
The "Reliable" Automatic Air Separating Tank and equipment is not included with "Reliable" Return Line Outfits, but is furnished at extra charge.

- A—Float
- B—Air Valve
- C—Ball Check Valve
- D—Float Stop
- E—Air Vent—1½ inch Pipe
- F—Float Shield
- G—Air Valve Stem
- H—Inlet—3 inch Pipe
- I—Outlet—3 inch Pipe
- J—Galv. Iron Tank
- K—Float Stop
- L—Air Valve Seat
- M—Height of Tank 26 inches
- N—Width of Tank 16⅜ in





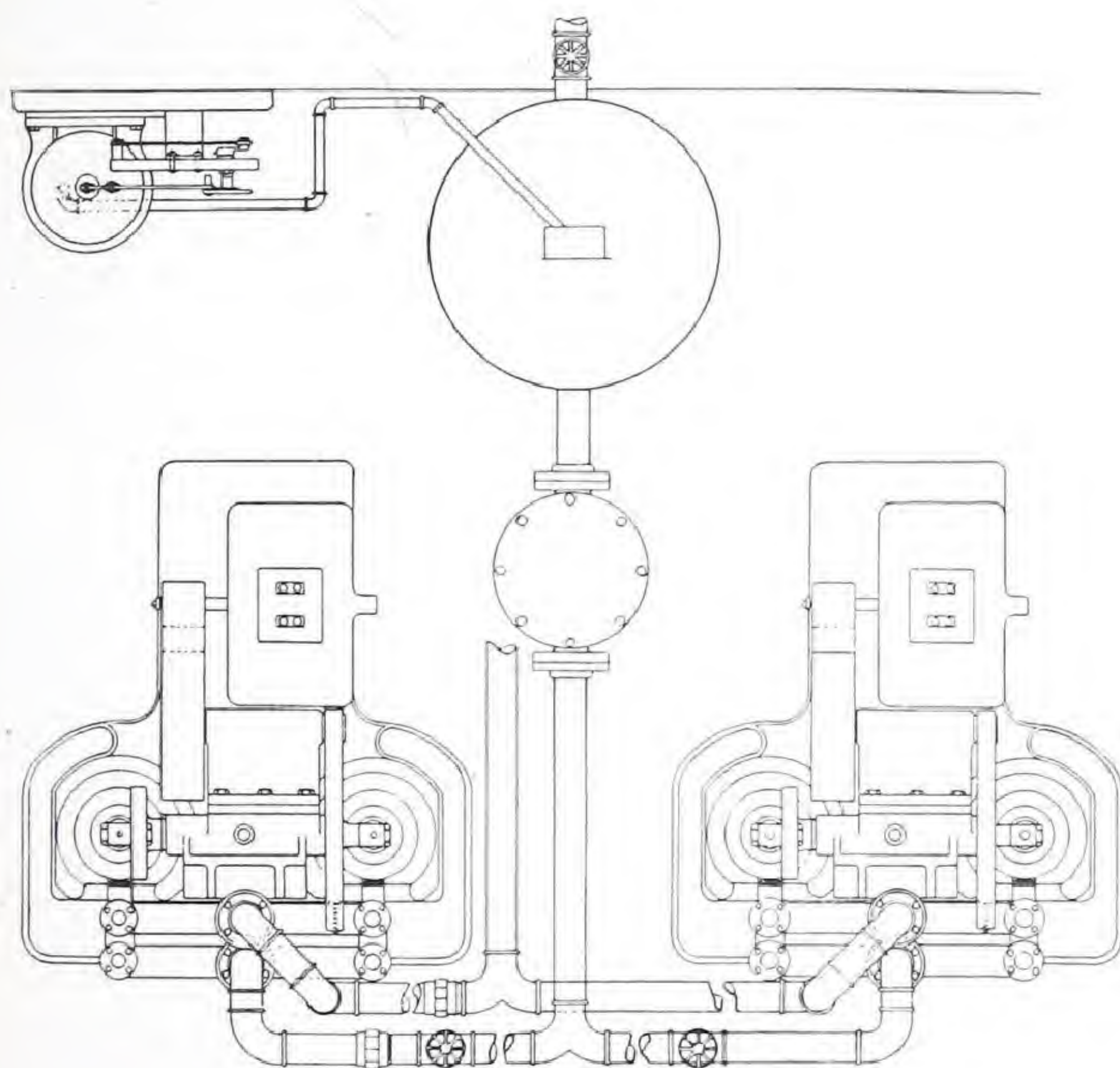
# THE "RELIABLE" RETURN LINE



The "Reliable" method of returning condensation to open receiving tank.



“RELIABLE” DUPLEX ELECTRIC  
RETURN LINE VACUUM PUMP  
INSTALLATION



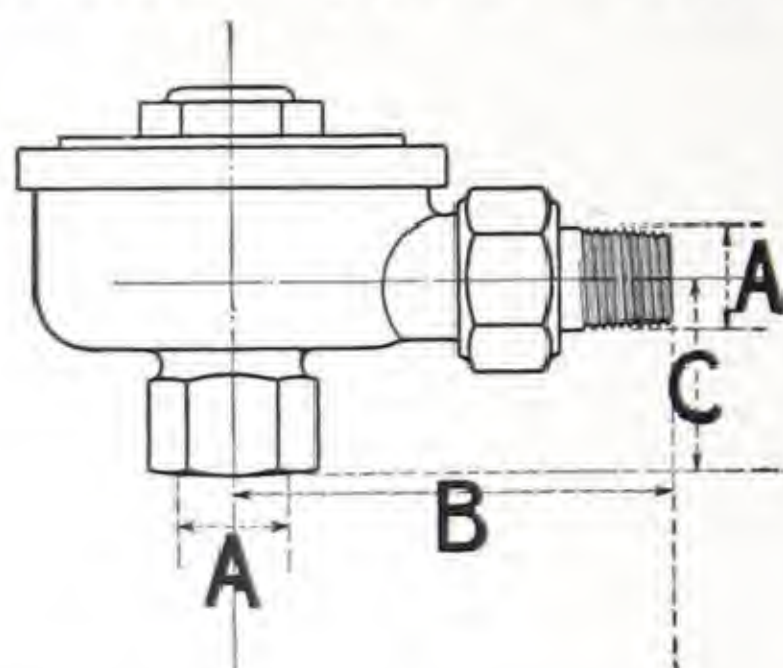
Top View

The above illustration shows method of cross-connecting two “Reliable” Electric Vacuum Pumps for use with heating systems having a larger amount of radiation than one pump can handle. Duplex installations are also used where a reserve unit is desired.



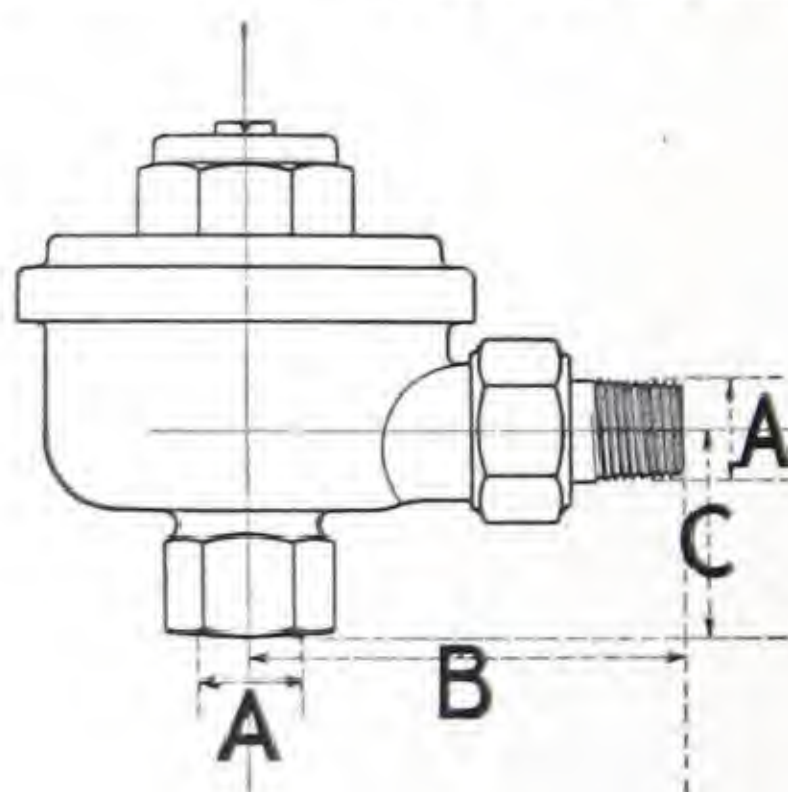
# THE "RELIABLE" RETURN LINE

## ROUGHING IN DIMENSIONS FOR THE LITTLE WONDER AND No. 1 "VACU-TRAPS"



TRAPS	A	B	C
	Inches	Inches	Inches
Little Wonder.....	$\frac{1}{2}$	$3\frac{1}{4}$	$1\frac{1}{2}$
No. 1 Vacu-Trap.....	$\frac{1}{2}$	$3\frac{5}{8}$	$1\frac{1}{2}$
No. 1 Vacu-Trap.....	$\frac{3}{4}$	$4\frac{1}{8}$	2
No. 1 Vacu-Trap.....	1	5	2

## ROUGHING IN DIMENSIONS FOR THE No. 2 FLUSHING "VACU-TRAPS"



TRAPS	A	B	C
	Inches	Inches	Inches
No. 2 Flushing Vacu-Trap.....	$\frac{1}{2}$	$3\frac{1}{2}$	$1\frac{5}{8}$
No. 2 Flushing Vacu-Trap.....	$\frac{3}{4}$	$4\frac{1}{4}$	$1\frac{3}{8}$
No. 2 Flushing Vacu-Trap.....	1	$4\frac{3}{4}$	$1\frac{3}{8}$

We do not show roughing in dimensions for straightway and right and left corner "Vacu-Traps" as they are made up "Special," but will gladly furnish such dimensions upon request.



# VACUUM HEATING SYSTEM

## SPECIFICATIONS AND DIMENSIONS OF "RELIABLE" ELECTRIC RETURN LINE VACUUM PUMPS

Number of Pump	Max. Cap. Sq. Ft. Direct Radiation	CYLINDER SIZES		SIZE OF CONNECTIONS		Strokes Per Minute
		Bore	Stroke	Discharge Pipe	Suction Pipe	
122	5,000	3 in.	3 1/2 in.	2 in.	2 in.	70
123	10,000	4 in.	3 1/2 in.	2 in.	2 in.	70
124	17,000	4 in.	5 in.	3 in.	3 in.	68
125	25,000	5 in.	5 in.	3 in.	3 in.	60

Number of Pump	Horse Power of Motor	DIMENSIONS			Shipping Weight Including Equipment
		Width	Height	Depth	
122	3/4	22 in.	25 in.	31 1/2 in.	693 lbs.
123	1	24 1/4 in.	25 in.	31 1/2 in.	955 lbs.
124	2	31 in.	31 1/2 in.	31 1/2 in.	1110 lbs.
125	2	31 in.	31 1/2 in.	31 1/2 in.	1232 lbs.

## SPECIFICATIONS AND DIMENSIONS OF THE "VACU-TRAPS"

T R A P S	Size Inlet and Outlet Connections	Height Over All	Length Over All	Diameter Body	Net Weight
	Inches	Inches	Inches	Inches	Pounds
Little Wonder Vacu-Trap	1/2	3 1/4	4 7/8	2 5/8	1 7/8
No. 1 Vacu-Trap . . . . .	1/2	3 1/8	5 3/8	3 1/8	2 1/8
No. 1 Vacu-Trap . . . . .	3/4	4 1/16	6 5/16	4	4
No. 1 Vacu-Trap . . . . .	1	4 1/16	7 1/4	4	4
No. 2 Flushing Vacu-Trap . . . . .	1/2	4 5/16	5 3/8	3 1/2	3 3/8
No. 2 Flushing Vacu-Trap . . . . .	3/4	4 11/16	6 5/16	4	4 3/4
No. 2 Flushing Vacu-Trap . . . . .	1	4 3/4	7 1/4	4	5



# THE "RELIABLE" RETURN LINE

## SUGGESTIONS FOR SPECIFICATIONS

When specifying the "Reliable" Return Line Vacuum Heating Equipment, the following suggestions are of value.

### PIPING

All piping shall be installed and graded in accordance with good engineering practice.

### ELECTRIC VACUUM PUMP AND EQUIPMENT

The Bishop-Babcock-Becker Company's No. \_\_\_\_\_ "Reliable" Electric Vacuum Pump and Equipment shall be used.

The installation shall be done in accordance with blue print furnished by the Bishop-Babcock-Becker Company.

### AUTOMATIC AIR SEPARATING TANK AND EQUIPMENT

The Bishop - Babcock - Becker Company's "Reliable" Automatic Air Separating Tank and Equipment shall be used, if returns are made to low pressure boiler, closed receiving tank, or closed feed water heater.

The installation shall be done in accordance with blue print furnished by the Bishop-Babcock-Becker Company.

### AUTOMATIC RETURN LINE VALVES

The Bishop-Babcock-Becker Company's "Vacu-Trap" of proper size shall be installed on return end of each radiator and coil, and on drips from the steam mains and risers.

### IMPORTANT

The System shall be made perfectly tight.

### CLEANING THE SYSTEM

After System has been properly installed, it shall be thoroughly cleaned by flushing with water.

*Note:— We will be pleased to furnish general information and suggestions upon request*







**THE**  
**RELIABLE**  
**RETURN LINE**  
**VACUUM**  
**HEATING**  
**SYSTEM**



Manufactured by  
**The Bishop-Babcock-Becker Co**